

**To:** Way, Steven[way.steven@epa.gov]  
**From:** Sorrenson - DNR, Allen  
**Sent:** Wed 5/6/2015 4:07:57 PM  
**Subject:** Re: FW: Red and Bonita Mine - bulkhead and Gold king mine portal rehab plans  
[am tunnel bulkhead 1 data.pdf](#)  
[sunnyside bulkheads orig design.PDF](#)

Steve, see page four of the attached design document; a limestone barrier was constructed upstream of the American Tunnel #1 bulkhead (and several other bulkheads). As the design document relates, and as Steve Fearn states in his email, this was an add-on by Sunnyside Gold Corporation ("additional insurance"), and not a requirement of John Abel's bulkhead design. Also see the pH column in the American Tunnel #1 bulkhead data sheet that is attached to this email. These data indicate that the limestone barrier was largely ineffectual in elevating pH at the upstream face of the bulkhead. Note that the elevated pH readings that were collected coincided with alkaline fluid injection into the mine when the bulkhead valve was open. There are a number of possible reasons why the limestone did not moderate the pH that we could discuss, and some alternative strategies that might be employed that might (or might not) be more effective. Installation of buffering materials upstream of the proposed Red and Bonita bulkhead wouldn't have any negative consequences that I can think of, other than additional cost and difficulty, but buffering materials are not necessary to protect the concrete, and have not been employed at the bulkheads DRMS has installed or been a part of the past decade or so.

On Tue, May 5, 2015 at 4:34 PM, Way, Steven <[way.steven@epa.gov](mailto:way.steven@epa.gov)> wrote:

Allen, before I respond, what's your take on this regarding the AT ?

Steven Way

Federal On-Scene Coordinator

Emergency Response Unit

US EPA - Region 8

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**From:** Fearn Engineering [<mailto:fearneng@rmi.net>]

**Sent:** Tuesday, May 05, 2015 3:54 PM  
**To:** Peter Butler; Way, Steven  
**Cc:** Bill Simon; Steve Fearn; Bruce Stover; Larry Perino  
**Subject:** RE: Red and Bonita Mine - bulkhead and Gold king mine portal rehab plans

Peter; Steve Way - that was what was done for the Sunnyside bulkheads, the Mogul and the Koehler bulkheads - just for additional insurance. Not a bad idea considering the part of the mountain on the north side of North Fork of Cement Creek is generally shot full of iron pyrite.

Steve Fearn

-----Original Message-----

From: Peter Butler

Sent: May 5, 2015 3:44 PM

To: "Way, Steven"

Cc: Bill Simon , Steve Fearn , Bruce Stover , Larry Perino

Subject: RE: Red and Bonita Mine - bulkhead and Gold king mine portal rehab plans

Steve – I'm not an engineer and so have little in terms of comment except:

Did you consider placing lime in the tunnel behind the bulkhead initially before building the forms. I realize that the mine drainage has a relatively high pH (maybe around 6), but it was lower when the mine first began to discharge. I'm wondering if pH might drop once the valve is closed. The lime might help keep the pH up and help protect the concrete from the effects of an acid environment.

Peter Butler

Personal Phone/Ex. 6

Personal Phone/Ex. 6

**From:** Way, Steven [<mailto:way.steven@epa.gov>]

**Sent:** Friday, May 01, 2015 11:18 AM

**To:** Peter Butler; Bill Simon; [fearneng@rmi.net](mailto:fearneng@rmi.net); Lewis, Brent; Kirstin Brown - DNR; Randy Perlis; Todd Hennis; Larry Perino ([larry.perino@kinross.com](mailto:larry.perino@kinross.com)); Lisa Richardson ([lrichard@blm.gov](mailto:lrichard@blm.gov)); Stover - DNR, Bruce; William Tookey

**Cc:** Schmittiel, Paula; Fagen, Elizabeth; [Allen.Sorenson@state.co.us](mailto:Allen.Sorenson@state.co.us); Peterson, Cynthia

**Subject:** RE: Red and Bonita Mine - bulkhead and Gold king mine portal rehab plans

Hello all;

As follow up to the questions raised at Tuesday's ARSG meeting about the status of the Red and Bonita work, I am providing this information in advance of our planned update at the May meeting. In short, we have been preparing to perform the work that we discussed with the ARSG and county commissioners last fall with respect to installing a bulkhead in the Red and Bonita adit and removing blockage/portal rehab at the Gold King adit. Work at the Gold King is being coordinated with our planning for the Red and Bonita work, which we hope will provide some cost efficiencies with crew and equipment.

#### Red and Bonita Mine: Status Report

1. The design specification for the bulkhead is attached for your information and review. (This will also be placed in the information repository at the library with associated design basis documentation.) The bid package with the design was released in mid-April to potential bidders, and we expect bids back in May.
2. Subcontractor selection will occur by May 30<sup>th</sup> assuming the bids are acceptable.
3. Onsite work is planned to begin at least by July 10<sup>th</sup> if not sooner depending on ground conditions.
4. Bulkhead construction is targeted for completion on or before September 30, 2015 including grouting after which, valve closure can occur within a week. This allows for monitoring subsequent to the closing of the valve and before winter conditions settle in.
5. Solids management and associated water treatment from mucking out the mine will occur at the Red and Bonita as the first step in July.
6. Monitoring before and after the bulkhead installation / valve closure is planned for

various locations including the adits in Cement Ck.

The design basis includes a conservative assumption of 540 psi for the hydrostatic pressure on the bulkhead. This is based on a theoretical water elevation at Lake Emma; this was used as a maximum possible elevation given an effective small difference in bulkhead length and concrete requirements. However, a more realistic value for a likely pressure has been derived and is considerably less than the Lake Emma pressure.

### Gold King Mine: Status Report

As you know we adjusted our plans based on findings last fall when we started the removal of the blockage at the adit. The current elevation of the top of the dump appears to be approximately 4 to 6 feet above the floor of the adit. A revised approach to the debris removal and portal construction were developed this winter, and is outlined in general below. Again, we did review this with ARSG members in the fall, and we will be able to discuss this again in May.

1. A conceptual design and basic specifications have been developed based on standard DRMS plans for portal construction using 10 ft diameter CMP. This is being used versus steel arch sets because of the nature of the terrain and ground conditions at the adit.
2. Re-grading a portion of the waste dump will be required initially to lower the receiving channel for the current discharge.
3. Water management during the removal of the blockage will be operated in similar manner to that at the Red and Bonita. We are planning on having to deal with a larger volume of water than originally anticipated based on the fact that there is a 4 to 6 foot impoundment at the beginning of the adit.
4. Entry into the workings will depend on the conditions encountered following the portal construction. (On this topic, in the past I have requested mine workings maps from members of the ARSG who indicated that they do have such maps. As you know, such maps would be very useful to the operations prior to and during the work.)

This information is provided as a preliminary outline of the plans that are still being developed. As for the bulkhead design details, while the bid package has been released with the design, if necessary , appropriate modifications can and will be made.

The opportunity for input to the specifics remains open and I look forward to discussing this with the group in late May.

Sincerely,

Steve

Steven Way

Federal On-Scene Coordinator

Emergency Response Unit

US EPA - Region 8

1595 Wynkoop Street

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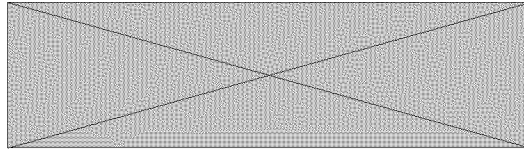
Office: 303-312-6723

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**Allen C. Sorenson**

Project Manager/Geological Engineer

Inactive Mine Reclamation Program



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